

I. Listing of Claims

1. (Currently Amended) A covering agent for forming a top slag of on a metallic steel melting bath, in a metallurgical vessel, of the type used in the steel industry, the covering agent comprising a material which melts on the melting bath and performs metallurgical work, the covering agent comprising wherein the material substantially comprises granules which have been rendered porous and having a porosity such that, at the temperature of the melt bath, a molten layer of liquid slag is formed on the melt bath, and a thermal barrier layer of the granules is formed above the molten layer of liquid slag.

a granular material that has been made porous, the grains of which have a porosity of 5 to 70 volume percent; and

the granular material being calcium aluminate having a ratio of CaO to Al₂O₃ between 0.25 to 1.5;

wherein, the covering agent forms both a slag melt and as a result of the grains being made porous, a thermal insulation layer on the steel bath.

2. (Previously Presented) The covering agent as claimed in claim 1, in which the granules have a grain size of between 1 and 50 mm.

3. (Previously Presented) The covering agent as claimed in claim 1, in which the granules have a grain size of between 2 and 20 mm.

4. (Previously Presented) The covering agent as claimed in claim 1, in which the granules are made up of shaped granules or a pelletized product.

5. (Previously Presented) The covering agent as claimed in claim 1, in which the granules are a granulated foam product or an expanded, granulated product.

6. (Previously Presented) The covering agent as claimed in claim 1, wherein the granules have a porosity produced by dewatering or calcining.

7. (Previously Presented) The covering agent as claimed in claim 1, wherein the granules have a porosity produced by organic combustibles.

8. (Canceled)

9. (Currently Amended) The covering agent as claimed in claim 8 1, wherein the covering agent further comprises calcium aluminate has the following chemical analysis and ratio:

~~CaO/Al₂O₃ from 0.25 to 4,~~

~~with up to 15% by mass of auxiliary phases, selected as at least one from and one or more of the group including MgO, MgOSiO₂, TiO₂, and Fe₂O₃, and/or alkali metals being present.~~

10. (Currently Amended) The covering agent as claimed in claim 8 1, wherein the calcium aluminate has the following chemical analysis and ratio:

CaO/Al₂O₃ from 1.0 to 1.5,

~~with up to 15% by mass of auxiliary phases, and one or more of the group including MgO, MgOSiO₂, TiO₂, Fe₂O₃, and alkali metals being present.~~

11. (Canceled)

12. (Previously Presented) The covering agent as claimed in claim 1, wherein the granules have a porosity of from 20 to 60% by volume.

13. (Currently Amended) A process for producing a covering agent for a top slag of a metallic melt bath in a metallurgical vessel of the type used in the steel industry comprising the steps of reacting fine-particle mineral raw materials with one another at high temperatures and are suitable for the top slag are mixed and heated until they react to form a mixture, and further

- a) providing at least one raw material which is dewatered or calcined so as to release at least one selected from the group of water vapor or gaseous products,
- b) forming the mixture into a shapeable compound using a combustible binder,
- c) shaping the shapeable compound to form material in granular form, and
- d) heating the material in granular form such that the binder is burnt out, generating pores porosity in the material from 5 to 70 volume percent by dehydration or calcining, and then a ceramic bond or a sintered bond is produced between the raw materials.

14. (Previously Presented) The process as claimed in claim 13, wherein milled raw materials with grain sizes of <90 μm are used.

15. (Previously Presented) The process as claimed in claim 13, wherein the binders used are one or more selected from the group including water, water glass, synthetic resins, sulfite waste liquor, phosphate compounds and calcined lime.

16. (Currently Amended) The process as claimed in claim 13 further comprising the step of using the covering agent to form a top slag melt and a thermal barrier layer on the ~~metallic~~ metallic melt bath, as a monolayer coating on the metallic melt bath.

17. (Previously Presented) The process as claimed in claim 13 further comprising the step of using the covering agent to form a thermal barrier layer on the metallic melt bath, as a thermal barrier agent on a metallic bath.

18. (Previously Presented) A process for producing a covering agent for a top slag of a metallic melt bath in a metallurgical vessel of the type used in the steel industry, comprising the steps of reacting fine-particle mineral raw materials which react with one another at high temperatures and are suitable for the top slag are mixed and heated until they react,

a) mixing the raw materials with one or more of the group including water, a foaming agent, an expanding agent, and a foam, so that pores are introduced into raw materials forming a mixture,

b) firing the mixture until a ceramic bond or a sintered bond is produced forming a fired product.

19. (Previously Presented) The process as claimed in claim 18, wherein the fired product is comminuted and classified.

20. (Previously Presented) The process as claimed in claim 18, wherein organic combustibles are added to the mixture in order to render it porous.

21. (Previously Presented) The process as claimed in claim 20, wherein one or more of paper fibers, sawdust, sawing chips, wood chips and/or styropor granules are added.

22. (Previously Presented) The process as claimed in claim 18, wherein the raw materials are selected for producing calcium aluminates .

23. (Previously Presented) The process as claimed in claim 22, wherein raw materials which ensure the following chemistry and ratio in the mixture:

CaO/Al₂O₃ from 0.25 to 4
are used.

24. (Previously Presented) The process as claimed in claim 22, wherein the raw materials which ensure the following chemistry and ratio in the mixture:

CaO/Al₂O₃ from 1.0 to 1.5
are used.

25. (Previously Presented) The process as claimed in claim 18, wherein the raw materials with a fineness of <90 μm are used.

26. (Previously Presented) The process as claimed in claim 18, wherein the raw materials which contain up to 15% by mass of auxiliary phases are used.

27. (Previously Presented) The process as claimed in claim 26, wherein the auxiliary phases are one or more of the group including MgO, MgOSiO₂, TiO₂, and Fe₂O₃ and/or alkali metals.

28. (Previously Presented) The process as claimed in claim 18, wherein the firing step is carried out at temperatures of up to 1250°C.

29. (Previously Presented) The process as claimed in claim 18, wherein dewatering or calcining raw materials are used.

30. (Currently Amended) The process as claimed in claim 18 further comprising the step of using the covering agent to form a top slag melt and a thermal barrier layer on the metallic melt bath, –as a monolayer coating on the metal metallic bath.

31. (Previously Presented) The process as claimed in Claim 18 further comprising the step of using the covering agent to form a thermal barrier layer on the metallic melt bath, as a thermal barrier agent on the metallic melt bath.